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K-1977
PATENT

In the application of: Gates, Jr. et al.

Serial No. 10/799,827

Filed: March 12, 2004

)
) GROUP ART UNIT 1775
)
) Examiner: Turner, ArcheneRESPONSE TO RESTRICTION REQUIREMENT OF MARCH 3, 2006Page 2CLAIM LISTING OF PENDING CLAIMS

1. (Original) A coated body comprising:

a substrate; and

a coating scheme on the substrate wherein the coating scheme includes an alpha-alumina coating layer that exhibits a platelet grain morphology at the surface of the alpha-alumina coating layer.

2. (Original) The coated body of claim 1 wherein the alpha-alumina coating layer being applied by chemical vapor deposition at a temperature ranging between about 750 degrees Centigrade and 920 degrees Centigrade.

3. (Original) The coated body of claim 1 wherein the coating scheme further including a modification coating layer applied by chemical vapor deposition wherein the modification coating layer includes oxygen and aluminum and one or more of carbon and nitrogen and one or more of the Group IVB elements of the Periodic Table; the alpha-alumina coating layer being applied on the modification coating layer; and the coating scheme further including an intermediate coating layer containing a carbonitride of one or more of a Group IVB element of the Periodic Table applied by chemical vapor deposition, and the modification coating layer being applied on the intermediate coating layer; and the coating scheme further including a base coating layer containing a nitride of one or more of a Group IVB element of the Periodic Table applied by chemical vapor deposition to the substrate, and the intermediate coating layer being applied on the base coating layer.

4. (Original) The coated body of claim 1 wherein the substrate comprises one of the following: a cemented carbide, a ceramic, a cermet and a polycrystalline cubic boron nitride.

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5. (Original) The coated body of claim 1 wherein the coated body comprises a coated cutting insert, and the coated cutting insert having a rake surface and a flank surface, and a cutting edge at the juncture of the rake surface and the flank surface.

6. (Original) The coated body of claim 1 wherein the coating scheme further including one or more coating layers on the alpha-alumina coating layer.

7. (Original) The coated body of claim 1 wherein the coating scheme including a base coating layer of alumina on the substrate.

8. (Original) A coated body comprising:

a substrate; and

a coating scheme on the substrate wherein the coating scheme includes a kappa-alumina coating layer that exhibits either a lenticular grain morphology or a polyhedra-lenticular grain morphology at the surface of the kappa-alumina coating layer.

9. (Original) The coated body of claim 8 wherein the kappa-alumina coating layer being applied by chemical vapor deposition at a temperature ranging between about 750 degrees Centigrade and 920 degrees Centigrade.

10. (Original) The coated body of claim 8 wherein the coating scheme further including a modification coating layer applied by chemical vapor deposition wherein the modification coating layer includes oxygen and aluminum and one or more of carbon and nitrogen and one or more of the Group IVB elements of the Periodic Table; and the kappa-alumina coating layer being applied on the modification coating layer; and the coating scheme further including an intermediate coating layer containing a carbonitride of one or

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more of a Group IVB element of the Periodic Table applied by chemical vapor deposition, and the modification coating layer being applied on the intermediate coating layer; and the coating scheme further including a base coating layer containing a nitride of one or more of a Group IVB element of the Periodic Table applied by chemical vapor deposition to the substrate, and the intermediate coating layer being applied on the base coating layer.

11. (Original) The coated body of claim 8 wherein the substrate comprises one of the following: a cemented carbide, a ceramic, a cermet and a polycrystalline cubic boron nitride.

12. (Original) The coated body of claim 8 wherein the coated body comprises a coated cutting insert, and the coated cutting insert having a rake surface and a flank surface, and a cutting edge at the juncture of the rake surface and the flank surface.

13. (Original) The coated body of claim 8 wherein the coating scheme further including one or more coating layers on the kappa-alumina coating layer.

14. (Original) The coated body of claim 8 wherein the coating scheme including a base coating layer of alumina on the substrate.

15. (Original) A coated body comprising:

a substrate; and

a coating scheme on the substrate wherein the coating scheme includes an alumina coating layer that contains alpha-alumina and kappa-alumina, and wherein the coating layer exhibits either a large multifaceted grain morphology or a polyhedra-multifaceted grain morphology at the surface of the alumina coating layer.

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16. (Original) The coated body of claim 15 wherein the kappa-alumina coating layer being applied by chemical vapor deposition at a temperature of ranging between about 750 degrees Centigrade and 920 degrees Centigrade.

17. (Original) The coated body of claim 15 wherein the coating scheme further including a modification coating layer applied by chemical vapor deposition wherein the modification coating layer includes oxygen and aluminum and one or more of carbon and nitrogen and one or more of the Group IVB elements of the Periodic Table; and the kappa-alumina coating layer being applied on the modification coating layer; and the coating scheme further including an intermediate coating layer containing a carbonitride of one or more of a Group IVB element of the Periodic Table applied by chemical vapor deposition, and the modification coating layer being applied on the intermediate coating layer, and the coating scheme further including a base coating layer containing a nitride of one or more of a Group IVB element of the Periodic Table applied by chemical vapor deposition to the substrate, and the intermediate coating layer being applied on the base coating layer.

18. (Original) The coated body of claim 15 wherein the substrate comprises one of the following: a cemented carbide, a ceramic, a cermet and a polycrystalline cubic boron nitride.

19. (Original) The coated body of claim 15 wherein the coated body comprises a coated cutting insert, and the coated cutting insert having a rake surface and a flank surface, and a cutting edge at the juncture of the rake surface and the flank surface.

20. (Original) The coated body of claim 15 wherein the coating scheme further including one or more coating layers on the alpha-kappa-alumina coating layer.

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21. (Original) The coated body of claim 15 wherein the coating scheme including a base coating layer of alumina on the substrate.

22. (Original) A coated body comprising:

a substrate; and

a coating scheme on the substrate wherein the coating scheme includes an alumina coating layer selected from the group comprising an alpha-alumina coating layer and a kappa-alumina coating layer and a kappa-alpha-alumina coating layer, and the coating layer being applied by chemical vapor deposition at a temperature ranging between about 750 degrees Centigrade and about 920 degrees Centigrade.

23. (Original) The coated body of claim 22 wherein the alumina coating layer comprises alpha alumina.

24. (Original) The coated body of claim 22 wherein the alumina coating layer comprises kappa alumina.

25. (Original) The coated body of claim 22 wherein the alumina coating layer comprises alpha-kappa alumina coating layer.

26. (Withdrawn) A method of coating a substrate comprising the steps of:

applying by chemical vapor deposition at a temperature ranging between about 750°C and about 920°C an alpha-alumina coating layer wherein the alpha-alumina coating layer exhibits a platelet grain morphology at the surface thereof.

27. (Withdrawn) A method of coating a substrate comprising the steps of:

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applying by chemical vapor deposition at a temperature ranging between about 750°C and about 920°C a kappa-alumina coating layer wherein the kappa-alumina coating layer exhibits either a lenticular grain morphology or a polyhedra-lenticular grain morphology at the surface thereof.

28. (Withdrawn) A method of coating a substrate comprising the steps of:

applying by chemical vapor deposition at a temperature ranging between about 750°C and about 920°C an alpha-kappa-alumina coating layer wherein the alpha-kappa-alumina coating layer exhibits either a large multifaceted grain morphology or a polyhedra-multifaceted grain morphology at the surface thereof.

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29. (Original) A coated body comprising:

a substrate comprising polycrystalline cubic boron nitride; and

a coating scheme on the substrate wherein the coating scheme comprises an alumina coating layer wherein the alumina coating layer is one of the following:

an alpha-alumina coating layer having a platelet grain morphology at the surface thereof, or

a kappa-alumina coating layer having either a lenticular grain morphology at the surface thereof or a polyhedra-lenticular grain morphology at the surface thereof, or

an alpha-kappa-alumina coating layer having either a large multifaceted grain morphology at the surface thereof or a polyhedra-multifaceted grain morphology at the surface thereof.

30. (Original) The coated body of claim 29 wherein the coating scheme further includes a base of alumina applied to the substrate.